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In-Vehicle Solutions

ACROSSER

Content

Acrosser EXPRESS
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About Acrosser

Founded in 1987, Acrosser was a pioneer in the evolution of industrial computing. For over 23 years, ACROSSER has provided innovative embedded computer solutions and quality products to over thousands customers on helping them reduce the time-to-market to gain the higher competence and to win the market.

Product Line Overview
In-Vehicle PC , Fanless Embedded System, ,Embedded SBC,Networking Applicance,Console Server,Industrial Computing,Gaming Platform

ITS/Telematics Excellent 100

REPUBLIC OF CHINA CENTENNIAL

Acrosser's In-Vehicle Computer Won "Taiwan excellent 100 on ITS/telematics" Award

Three Acrosser Technology In-Vehicle products are awarded as the winner of Taiwan Excellent 100 on ITS/Telematics". The event is held by the Telematics Promotion Office, the Ministry of Economic Affairs (MOEA) to showcase the amazing achievements of the Taiwan telematics industry. The event has selected 100 winning entries whose developments have been well-completed. Through the efforts of the panel of professional judges, 100 of the entries with outstanding technical capability and market potentials were particularly selected among several hundreds of the products and services.

Three winners of "Taiwan ITS/Telematics Excellent 100" Award:
(1)AR-V6002FL : Atom D425/D525 In-Vehicle Computer
(2)AR-V5403FL : Core 2 Duo In-Vehicle Computer
(3)AR-B104D : CAN bus, NVRAM , Digital I/O PCI-104 Module

Winner 1

In-Vehicle Computer – AR-V6002FL

1. Support Intel Atom D425/D525
2. 8-bit GPIO(4 in , 4 out)
3. Internal GPS/3.5G/WiFi/Bluetooth module option
4. CAN Bus support CAN 2.0A/2.0B protocol
5. Smart power management with low power protection, ignition control,on/off delay,and software programmable delay timing

Winner 2

In-Vehicle Computer – AR-V5403FL

1. Support Core 2 Duo / Core Duo/ Core Solo / CeleronM
2. 4-bit GPIO (2 In, 2 Out)
3. GPS / 3.5G / Wifi / Bluetooth Module Option
4. External Removable HDD Bay
5. Software programmable power off delay

Winner 3

CAN bus,NVRSM, Digital I/O PCI-104 Module –AR-B104D

1.12x optical isolated digital inputs. Support counter mode
2.12x 500 mA current sink digital outputs.
3.Support pulse generator mode
4.1MB battery backup SRAM disk. Supports disk and memory modes.
5.CAN bus support 2.0A and 2.0B protocol.
6.Time stamp of CAN message
7.Linux and Windows 2000, XP Software Development Kit (SDK).

The in-vehicle computer power subsystem challenges

The challenging electrical and environment conditions found in modern automobile have a strong impact on the design of automotive power electronic equipment. Important factors affecting the design of electronics for this application include static and transient voltage ranges, electromagnetic interference and compatibility requirements (EMI/EMC).

The transients on the automobile power supply range form the severe, high energy, transients generated by the alternator/regulator system to the low-level ''noise'' generated by the ignition system and various accessories. A standard automotive electrical system has all of these elements necessary to generate undesirable transients
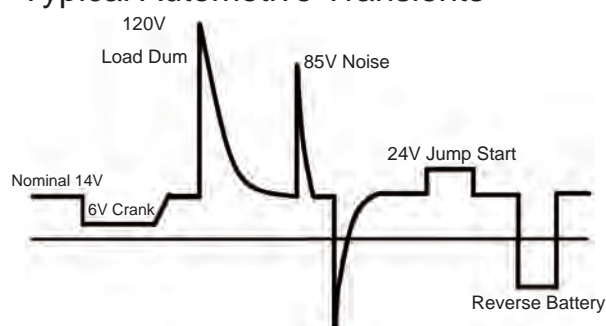
The Society of Automotive Engineers (SAE) has defined the automotive power supply transients which are present in the system. Table 1 shows some sources, amplitudes, polarity, and energy levels of the generated transients found in the automotive electrical system(1).

With the extensive use of computer in today's vehicles, protection from transient over voltages is essential to ensure reliable operation

Typical Automotive Transients

Table 1. TYPECAL AUTOMOTIVE TRANSIENTS

LENGTH OF TRANSIENT	CAUSE	ENERGY CAPABILITY VOLTAGE AMPLITUDE	FREQUENCY OF OCCURRENCE
Steady State	Failed voltage regulator	● +18V	Infrequent
5 Minutes	Jump Start with 24V battery Infrequent	● +/-24V	Infrequent
200ms to 400ms	Load dump; disconnection of battery while at high charging	<10J <125V	Infrequent
<320 us	Inductive-load switching transient	<1J 300V to +80V	Often
200ms	Alternator field decay	<1J -100V to -40V	Each Turn-Off
90ms	Ignition pulse, battery disconnected	<0.5J <75V	<500Hz Several Times in Vehicle Life
1ms	Mutual coupling in harness	<1J <200V	Often
15us	Ignition pulse, normal	<0.001J 3V	<500Hz Continuous
Burst	Accessory noise	<1.5V	50Hz to 10kHz
Burst	Transceiver feedback	~ 20mV	R.F.
<50ns	ESD	<10mJ 15kV	Infrequent/ Random

Acrosser Solution

All Acrosser's in-vehicle computer power subsystem is designed with protections to prevent damage from most of the transient over voltage in vehicles.

> **1. Automotive Transient Voltage Suppression**
> **2. Over Voltage and Under Voltage Protection**
> **3. Over Current Protection**
> **4. Reverse Voltage Protection**
> **5. Automotive Fuse**

Acrosser ensure its in-vehicle computers perform as designed during and after exposure to disturbance by certified with the E-Mark.

E/e-Mark is the Economic Commission of Europe (ECE) that grants certificates to ensure all automobiles equipments sold by manufacturers meet traffic safety and environmental protection requirements.

The E-Mark certification includes a series of vehicle transient voltage test according to the ISO 7637-2. ISO 7637-2 was prepared by Technical Committee ISO/TC 22, Road vehicles. It defined specifies bench tests for testing the compatibility to conducted electrical transients of equipment installed on passenger cars and light commercial vehicles fitted with a 12 V electrical system or commercial vehicles fitted with a 24 V electrical system — for both injection and the measurement of transients. There are 8 types of test pulse defined to simulate different transient voltage in real vehicle environments. Table 2 shows the test pulses defined in ISO 7637.

Test Pulse	Simulation
a	This test is a simulation of transients due to supply disconnection from inductive loads. It is applicable to DUTs which, as used in the vehicle, remain connected directly in parallel with an inductive load
2a	Pulse 2a simulates transients due to sudden interruption of currents in a device connected in parallel with the DUT due to the inductance of the wiring harness
2b	Pulse 2b simulates transients from d.c. motors acting as generators after the ignition is switched off.
3a & 3b	These test pulses are a simulation of transients which occur as a result of the switching processes. The characteristics of these transients are influenced by distributed capacitance and inductance of the wiring harness.
4	This pulse simulates supply voltage reduction caused by energizing the starter-motor circuits of internal combustion engines, excluding spikes associated with starting
5a, 5b	This test is a simulation of load dump transient, occurring in the event of a discharged battery being disconnected while the alternator is generating charging current and with other loads remaining on the alternator circuit at this moment. Load dump may occur on account of a battery being disconnected as a result of cable corrosion, poor connection or of intentional disconnection with the engine running.

Power Management for In-Vehicle PC

When designing an in-vehicle PC, there are a lot of challenges that system integrators might experience due to the harsh in-vehicle environment and the real on-field applications, especially for the power management. Acrosser, as an IPC manufacturer for over 23 years, has designed the comprehensive intelligent power management subsystem solution for the in-vehicle PC to conquer all the challenges and provides the advanced features to benefit the in-vehicle application.

Challenge 1: Different type of in-vehicle battery and unstable power

Solution : Wide range power input

In general, there is 12V or 24V battery in use for vehicle. Acrosser power management subsystem will take wide range power input to support both kinds of batteries. And there might be a random surge or unstable power output from the battery during operation that the wide range input feature can protect the system from unstable surge as well. Acrosser's in vehicle computers are all protected with over voltage, transient voltage suppression protections to meet ISO 7637-2 standard.

Challenge 2: In-vehicle PC might drain the main battery

Solution : Power on/off retry

It's very important to not have in-vehicle PC drain the main vehicle battery. First, The Acrosser power management subsystem will automatically determine whether it's a 12V or 24V battery, and automatically set different threshold

correspondingly. Then it will constantly monitor the input voltage from the main battery. Once the input voltage is lower than the pre-defined threshold for a period of time, it will trigger the shut down process to prevent the in-vehicle PC from draining the main battery.

Challenge 3: Car ignition doesn't power up the PC properly

Solution : Power on/off retry

When the system power on/off mode is controlled by the car ignition, it's impossible to turn off the ignition and turn it back on just to restart the in-vehicle PC. Hence, Acrosser power management subsystem will automatically detect and monitor the system status. If the system isn't powered on/off properly by ignition, the power management subsystem will retry until success. When the system power on/off mode is controlled by the car ignition, it's impossible to turn off the ignition and turn it back on just to restart the in-vehicle PC. Hence, Acrosser power management subsystem will automatically detect and monitor the system status. If the system isn't powered on/off properly by ignition, the power management subsystem will retry until success

Challenge 4: Hard to define and customize power control mode and delay time

Solution : User friendly interface

Without worrying about the hardware configuration or software programming, Acrosser implements a user friendly interface for user to easily define and customize the power delay time and the system power on/off control mode. Application program can also change the parameters through APIs provided in software development kit

Challenge 5: Unknown in-vehicle PC operation status

Solution : Status LED

Some applications might not attach a display to the in-vehicle PC, so it becomes difficult to know the system status of the PC and to diagnose if any problem happened. Hence Acrosser builds in a system status LED to indicate the current system status, such as in operation, in power delay, in standby or in system off status.

## Challenge 6: No power provided after vehicle ignition is off

Solution : Power delay control

To consider the reality that user may need to synchronize or upload data from in-vehicle PC to the control center after vehicle ignition is off. The power delay control allows user to operate the in-vehicle PC after the ignition is off for a period of time and then properly shut down the PC automatically.

Solution: Power delay control
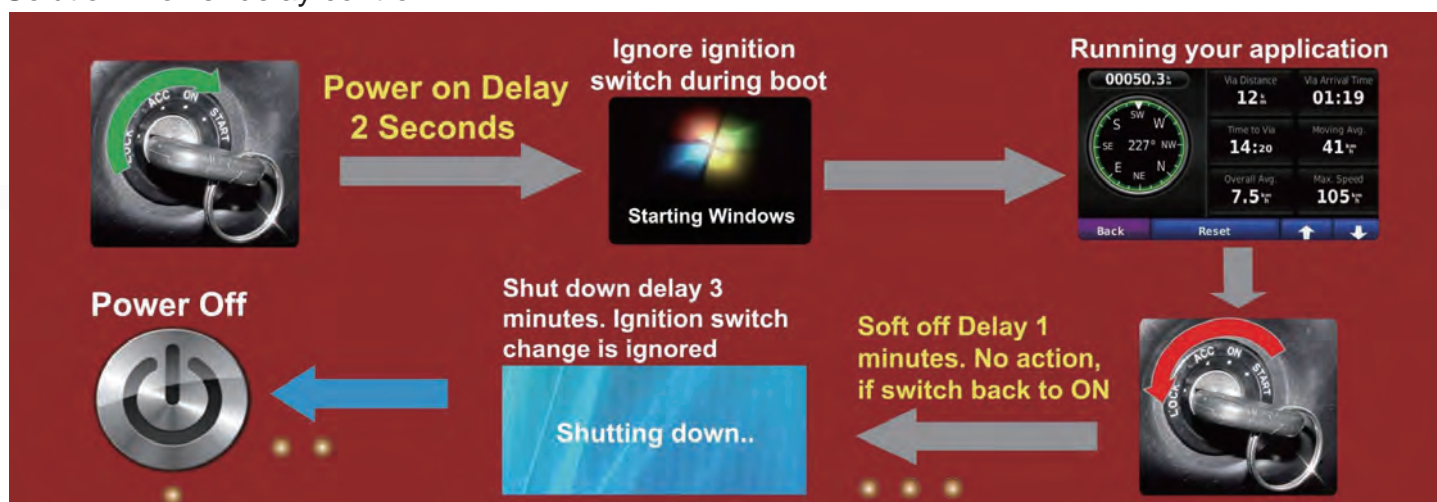
Features	Benefits
9V to 32V DC wide range power input	Support 12V and 24V vehicle and protect from surge
Input voltage monitoring and auto shut down	Avoid PC to drain vehicle battery
Power control by ignition or remote switch	Flexibility of systems integration
Power on/off fail retry	Increase system reliability
Programmable power off delay	Flexible operation scheme with user friendly interface
System status LED indicator	Easy diagnostic
Over current and voltage protection	Safety
External accessible fuse	Easy Maintenance

How Thermal Solution Save Your Money

With the fast growing demands of In-Vehicle Computers, multi applications and complicated system integration over In-Vehicle Computers are more and more important. Nowadays, In-Vehicle Computer is already a powerful control center built-in with different wireless modules(GPS/Wi-Fi /3.5G/Bluetooth) and controls several peripherals in vehicle. By the requirements of highly integrated system structure with build-in wireless modules, good CPU performance,

Heat sink and heat pipe thermal solution:
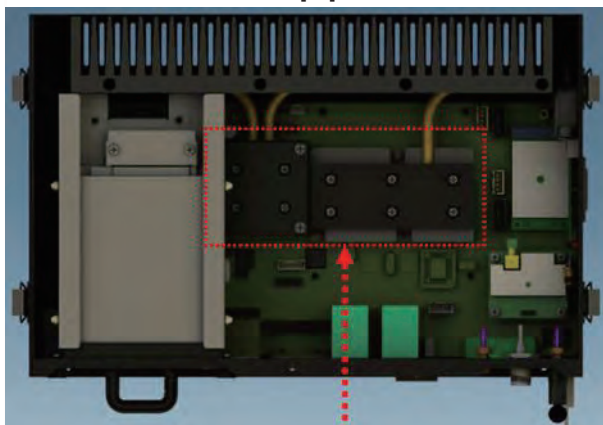
wide range operating temperature and fanless design, In-Vehicle Computers thermal problem becomes a challenge to makers.

How to solve thermal problem of In-Vehicle Computers:

The easiest way to reduce heat for thermal problem is to use low voltage or even ultra-low voltage CPU. This kind of CPU has lower TDP and generates less heat. But at meanwhile, it has poor CPU performance and high cost.

Instead of the easy way, we devote in the thermal design of the whole system. We analyze the system thermal model and design optimized heat sink and heat pipe solution to solve thermal problem. By this way, we can use general mobile CPU to keep good CPU performance and cost, at the same time, we still have good thermal performance in our system.

Comparison table for General Mobile CPUs and Low Voltage CPUs:

Product Name	Core™ Duo Processor T2500	Core™ Duo Processor T5500	Core™ Duo Processor T7400	Core™ Duo Processor L2400	Core™ Duo Processor L7400
Code Name	Yonah	Merom	Merom	Yonah	Yonah
Processor Number	T2500	T5500	T7400	L2400	L2400
# of Cores	2	2	2	2	2
# of Threads	2	2	2	2	2
Clock Speed	2 GHz	1.66 GHz	2.16 GHz	1.66 GHz	1.5 Ghz
L2 Cache Cache	2 MB	2 MB	4 MB	2 MB	4 MB
System Bus	667 MHz	667 MHz	667 MHz	667 MHz	667 MHz
Instruction Set	32-bit	64-bit	64-bit	32-bit	64-bit
Max TDP	31 W	34 W	34 W	15 W	17 W
CPU Performance (PassMark)	963	921	1237	792	868
Intel Recommended Channel Price	$264	$177	$265	$278	$297

Mobile Asset Management Systems

- Telecom Carrier (USA)
- AR-V5403FL works as a control center for multi-function systems on Mobile workstation vehicle.

Device	Purpose
RFID	Manage material on Vehicle(stock control)
WiFi	For short distance data sync.
3G	Allow HQ to access every system on Vehicle to check the status
GPS	Tracking and recording each Vehicle's location
Bluetooth	Connection with Driver's handheld device to sync.

3G — Remote Control

GPS — Asset Management &Navigation

Bluetooth — Data Input With Handheld

Wifi — Data Sync

RFID — Stock Management
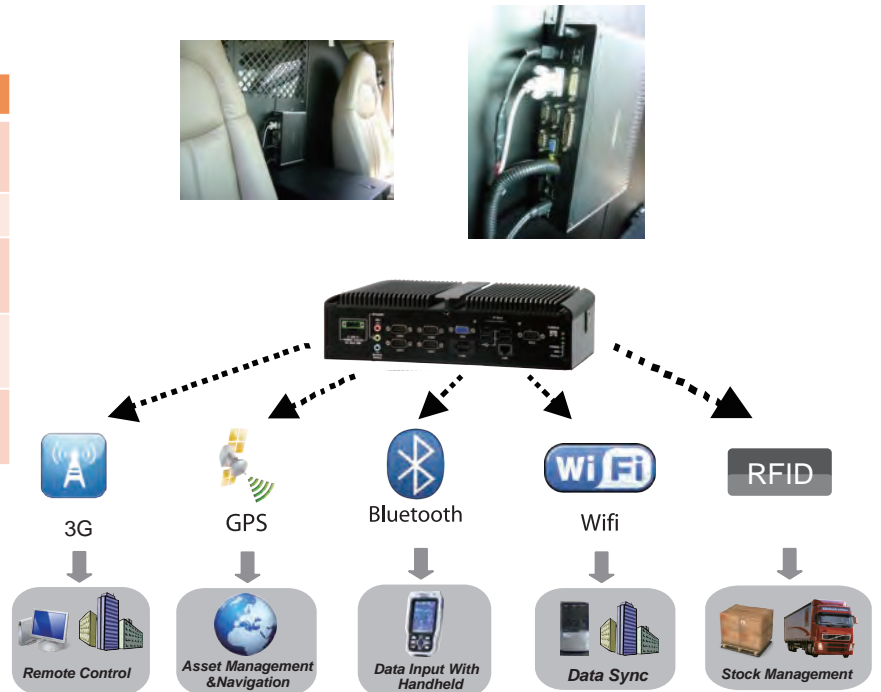
Weighting System for Recycle Collecting

- Recycle collecting Truck (Ireland, UK, USA)
- AR-V6002FL works as database center.
- Installing RFID technology in all trucks. Once the bin is picked up, system will identify the ID and communicate back to the server (Waste management) through GPRS, also link data to the customer account as indicated below.

Customer Details

Collection Point Details

Bin Details

Vehicle Details

GPRS

Computer Waste Server
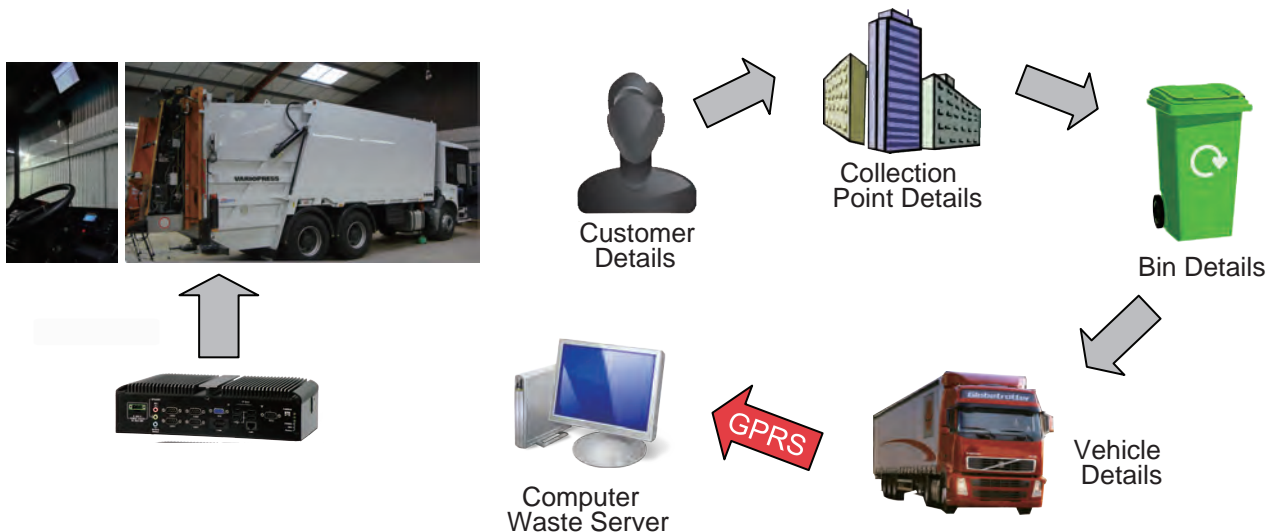
Airport Vehicle Traffic Management

- Airport in France
- AR-V6002FL works as a control computer on airport vehicle. Airport control center can do traffic management by locating and route planning through each vehicle computer.
- A-GPS is used for faster and more precisely position locating.
- Improve traffic safety especially in winter foggy morning and at night.

AR-V6002FL

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Service Center

Dispatch
Management

Fleet
Management

Worksheet
Management
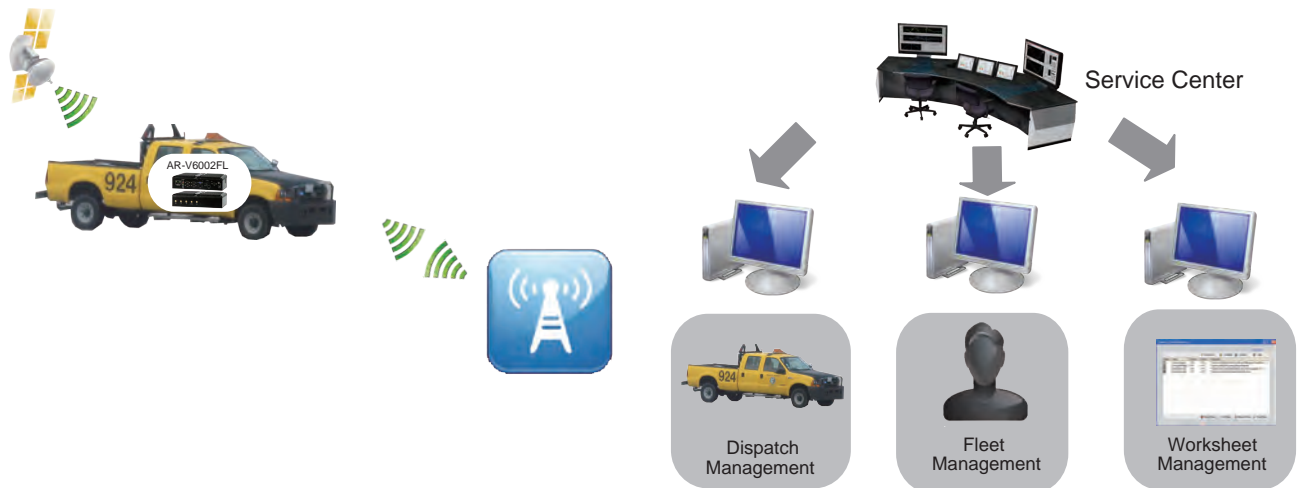
Drivers Fatigue Management

- Mining Truck (Australia, Brazil, USA, Indonesia)
- AR-V5430FL works as a fatigue management & database center.

Device	Purpose
WiFi	For data sync and software update.
GPS	Tracking and recording each Vehicle's location
IEEE1394: IR pod(emitter) & IR camera	Drivers Fatigue Management: Monitoring Driver's head tilt angle, eyelids blinking interval and frequency.
Digital I/O: Warning speaker & Seat vibrator	Alarm and wake up system: Sound Alarm and Seat vibration to wake up drivers.

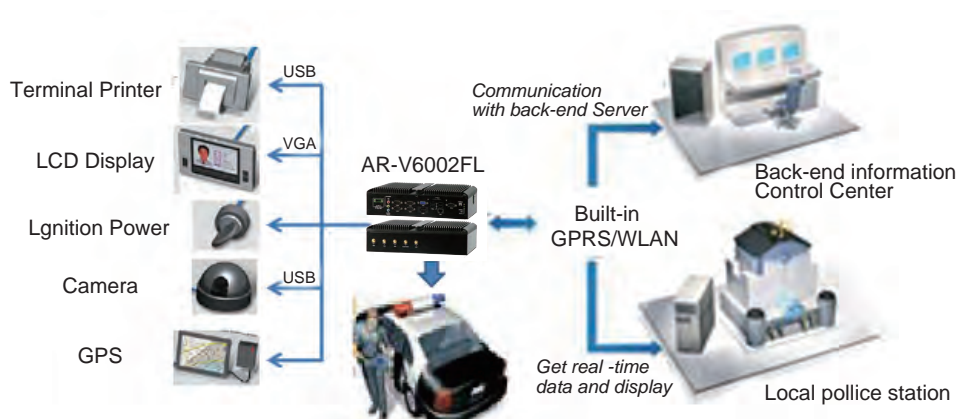The system is running on the mining sites all over the world (USA,Brazil, Indonesia..etc)

Audio warning and
Seat vibration

Audio speaker

+

Sensor

Sensor detect driver status

Infrared Sensor

AR-V5403FL

*Fleet Management and
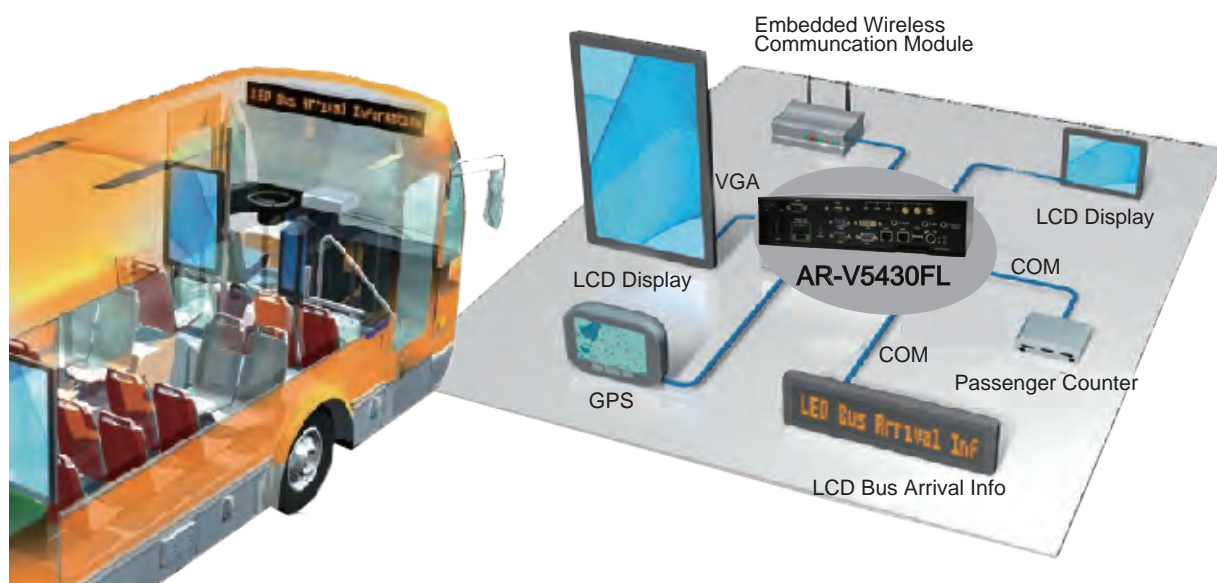Data transmission*

Control Center

Municipal Vehicle Management

- Municipal Vehicle , such as police car and fire truck. (Canada)
- Canada government use AR-V6002FL in their municipal vehicle to be a control center. With built-in wireless communication module, operator can locate their position and feedback the information for dispatcher immediately. There is also a dashboard with more than 70 gauges in the vehicle, Acrosser platform help monitor data and trigger the events following their rules.

Terminal Printer
USB
LCD Display
VGA
AR-V6002FL
Lgnition Power
Camera
USB
GPS

Communication with back-end Server

Back-end information Control Center

Built-in GPRS/WLAN

Get real -time data and display

Local pollice station

Public Transportation

- Bus application. (USA)
- Use customized AR-V5430FL which combined with 4 COM ports expansive PCI-104 card, bus can equipped with monitors for information display, passenger management like passenger counter and payment reader.

Embedded Wireless Communcation Module

VGA

LCD Display

AR-V5430FL

LCD Display

COM

LCD Display

COM

GPS

Passenger Counter

LCD Bus Arrival Info

Acrosser in Vehicle Computers and Solutions

Acrosser's in Vehicle Computer products include **in vehicle computers, touch monitors** and **Uninterruptible power supply.** All these products are specially designed for in vehicle applications such as infotainment, fleet management, telematics, video surveillance, taxi dispatch and low enforcement.
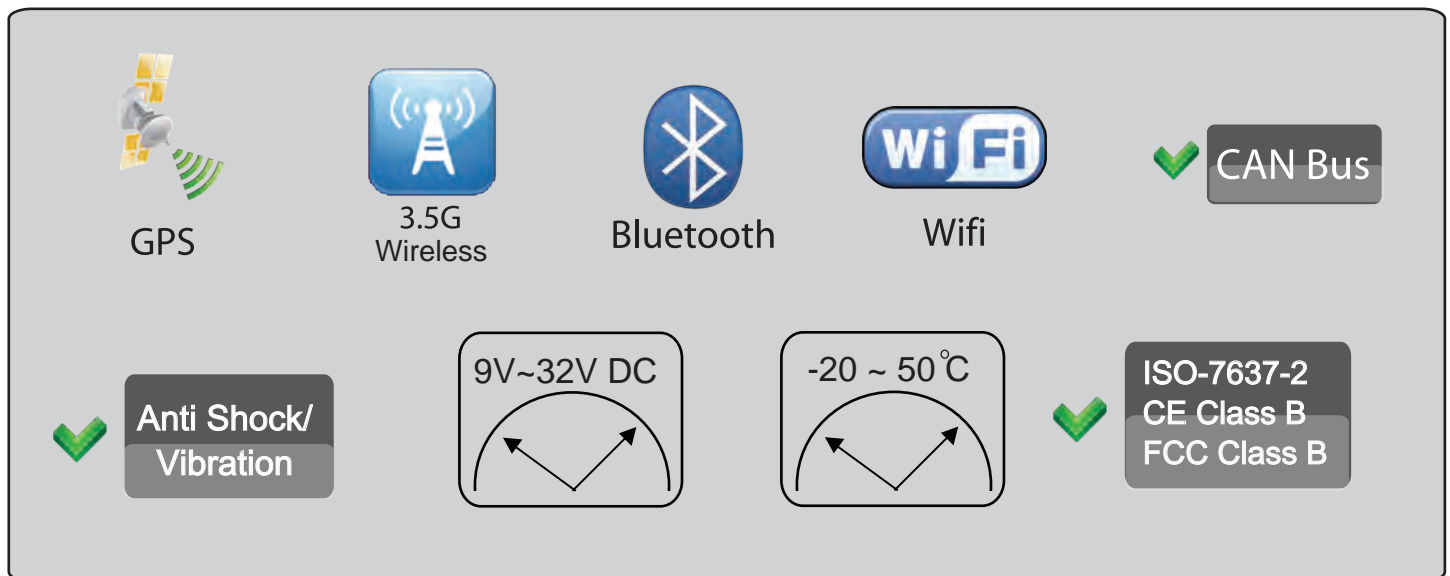
Design for harsh environment:

All in vehicle applications require a reliable design to meet the harsh environment in vehicle and during the move.

1. Reliable DC to DC power supply which supply stable voltage and current to the computer and monitor. **(9-32V DC input)**

2. Protecting circuit to protect devices against static and transient voltage ranges, electromagnetic interference.
   (ISO 7637-2, CE/FCC class 2, E-Mark certifications)

3. Power management sub-system to manage the **power ON/OFF by ignition behavior** and programmable **ON/OFF delay.**

4. Mechanism and design for **anti shock and vibration.** (IEC-60068-2-27 & 64)

5. **Fanless and dust proof** enclosure

6. Efficient thermal design to meet wide operating temperature range. **(-20 to 50 degrees C: Natural convection, no air f low, continuously full load operation)**

7. Low temperature start up: **-30 degrees C**

Features for mobility:

1. Long distance communication: build in **GSM/GPRS/3G/HSPSD** module

2. Short distance communication: **WiFi 802.11b/g/n** for both Access Point (AP) and station mode.

3. **Bluetooth** communication with handheld devices.

4. In vehicle communication: **CAN bus** interface.

5. Global Position System **(GPS)** receiver

GPS 3.5G Wireless Bluetooth Wifi CAN Bus

Anti Shock/ Vibration 9V~32V DC -20 ~ 50°C ISO-7637-2 CE Class B FCC Class B

Model No.	AR-V5430FL	AR-V5403FL	AR-V6002FL
Specification			
CPU	Intel Core 2 Duo/Core Duo/Core Solo/Celeron M	Intel Core 2 Duo/Core Duo/Core Solo/Celeron M	Intel Atom D425/D525
Chipset	Intel 945GME+ICH7M	Intel 945GME+ICH7M	Intel ICH8M
Memory	1 x DDR2 socket (1GB pre-installed, Max. 2GB)	1 x DDR2 socket (1GB pre-installed, Max. 2GB)	1 x DDR3 socket (1GB pre-installed, Max. 4GB)
Video			
Graphic Controller	Intel 945GME integrated	Intel 945GME integrated	Integrated within Atom D425/D525
Video Interface	1 x VGA port , 1 x DVI port	1 x VGA port	1 x VGA port
Storage			
IDE	1 x IDE (44-pin)	-	-
SATA	1 x SATA II port	2 x SATA II port	2 x SATA II port
CF	1 x External Compact Flash Type I/II socket	1 x External Compact Flash Type I/II socket	1 x External Compact Flash Type I/II socket
Disk Bay	1 x Anti-shock 2.5" HDD bracket	1 x Anti-shock 2.5" HDD bracket swappable without open case	1 x Anti-shock 2.5" HDD bracket
I/O			
Expansion Slot	1 x PCI-104 slot	1 x miniPCIe (FOR Optional 3.5G Module)	2 x miniPCIe (FOR Optional 3.5G&WiFi Module)
Ethernet	2 x Gbps LAN	2 x Gbps LAN	1 x GbE LAN
Serial Port	2 x RS-232	2 x RS-232	2 x RS-232/422/485 , 2 x RS-232
USB	3 x USB 2.0	4 x USB 2.0	4 X USB 2.0
GPIO	8-bit GPIO (4 In, 4 Out)	4-bit GPIO (2 In, 2 Out)	8-bit GPIO (4 In, 4 Out)
Audio	1 x MIC-In , 1 x SPK-Out	1 x MIC-In , 1 x SPK-Out	1 x MIC-In , 1 x SPK-Out
Remote control	1 x Remote control	1 x Remote control	1 x Remote control
SIM	-	1 x External SIM slot	1 x External SIM slot
CAN Bus	-	-	1 x 2pin JST connector, Support CAN 2.0A/2.0B protocol
Hardware Feature			
WatchDog Timer	-	Software programmable 0~255 sec.	Software programmable 0~255 sec.
Power Requirement			
Power Input	Wide range input DC 9V~32V	Wide range input DC 9V~32V	Support DC 12V/24V power input
Software			
OS Support	Windows XP/ XP embedded, Linux Fedora 6/7/8/9	Windows XP/ XP embedded, Linux Fedora 12	Windows XP/XP embedded/ Windows 7/ Linux fedora 12
Mechanical & Environment			
Operating Temp.	-20~50°C	-15~50°C -15~45°C for T7400 CPU	-20~50°C
Vibration	Comply IEC 60068-2-64	Comply IEC 60068-2-64	Comply IEC 60068-2-64
Shock	Comply IEC 60068-2-27	Comply IEC 60068-2-27	Comply IEC 60068-2-27
Safety	CE, FCC class B, E-Mark 13	CE, FCC class B	CE/FCC class B, E-Mark 13
Optional Wireless Module			
GSM/GPRS	V	-	-
GSM/GPRS/EDGE/ UMTS/HSDPA	-	Sierra and Huawei for selection	Sierra and Huawei for selection
GPS	V	V	V
Wifi	IEEE 802.11 b/g	IEEE 802.11b/g	IEEE 802.11b/g /n
Bluetooth	-	V	V

ITS/Telematics
Excellent 100

Features

✔ Support Intel Atom D425/D525

✔ Internal GPS/3.5G/WiFi/Bluetooth module option

✔ CAN Bus support CAN 2.0A/2.0B protocol

✔ 9~32V power input for standard car battery

✔ Smart power management with low power protection, ignition control,on/off delay,and software to control delay timing.

Specification

System

CPU	Intel Atom D425/D525
Chipset	Intel ICH8M
Memory	One DDR3 SO-DIMM socket,support up to 4G 1G pre-install

Video

Graphic Controller	Integrated within Atom D425/D525
Video Memory	N/A
Video Interface	● 1 x VGA port (DB15)

Storage

IDE	N/A
SATA	2 x SATA II port
CF	1 x External Compact Flash Type I/II socket
Disk Bay	1 x 2.5" Disk bay with Anti-vibration/Anti-shock solution for SSD only

I/O

Expansion Slot	2 x mini-PCIe(Reserve for WiFi and 3.5G)
Ethernet	1 x GbE RJ45,Realtek 8111D
Serial Port	2 x RS-232/422/485 , 2 x RS-232 , 1 x RS-232 pin header
USB	4 X USB 2.0 , 2 x USB 2.0 pin header
GPIO	8-bit GPIO (4 In, 4 Out)
Audio	1 x MIC in , 1 x Audio out , 1 x Remote switch
Antenna Hole	1 x SMA for GPS, 1 x SMA for 3.5G, 2 x SMA for WiFi, 1 x SMA for Bluetooth
SIM	SIM Slot x 1, SIM card changeable without opening case, latch to protect SIM uncertainly touch
CAN BUS	2 pin JST connector , support CAN 2.0A/2.0B protocol

Others

GPS(option)	GPS Module (Internal USB)
3.5G(option)	3.5G Module (Mini PCIe 1)
WiFi(option)	Wifi (Mini PCIe 2)
Bluetooth(option)	Bluetooth module (Internal USB)

Hardware Feature

WatchDog Timer	Software programmable 0~255 sec.

Softwatre

|	
OS Support	Windows XP/XP embedded/Windows 7/ Linux fedora 12

Power

Power Input	Power onboard design (AR-B6002)
	 ● Fuse Design
	 ● Smart ATX power function:
	   a. Power on/off retry
	   b. Adjustable delay time for system OFF by Switch on power module (Mode2~Mode7) (Default is mode 2)
	   c. System on/off by Vehicle ignition or Remote switch button
	   d. Low Power input monitoring, Auto shutdown
	 ● S/W configurable
	 ● Remote switch(audio jack)
	 ● System status LED(blue)

Power Consumption	Max Load 47W

Mechanical & Environment

Dimension(W x D x H)	(L) 280 x (W) 181.5 x (H) 76.8 (mm) , 2.7KG
Operating Temp.	-20~50°C (-4~122°F)
Storage Temp.	-40~80°C (-40~176°F)
Safety	CE/FCC class B / E-Mark 13

Dimensions
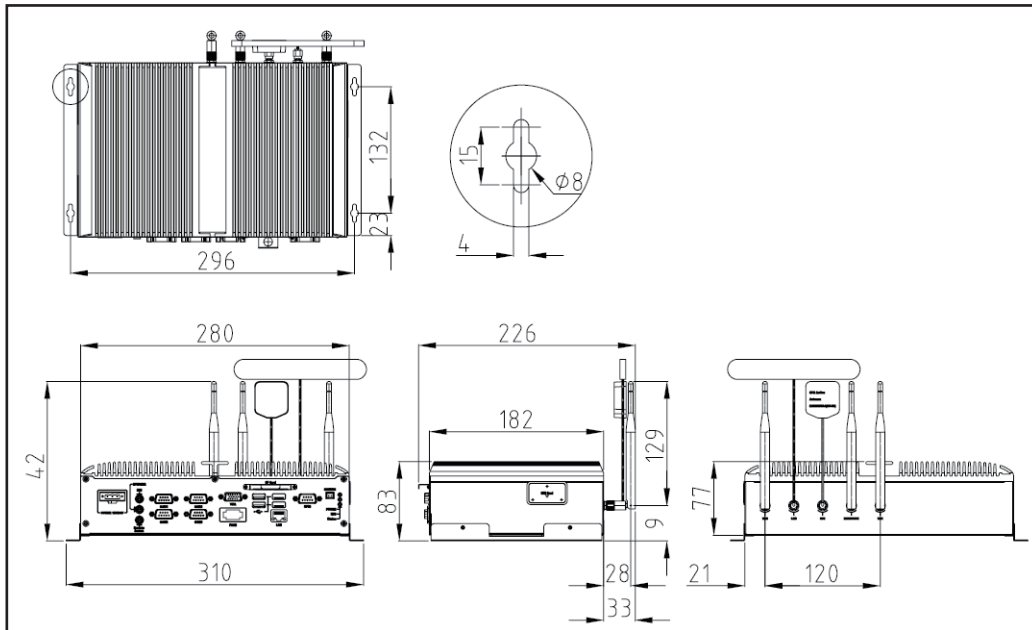
I/O Connectors
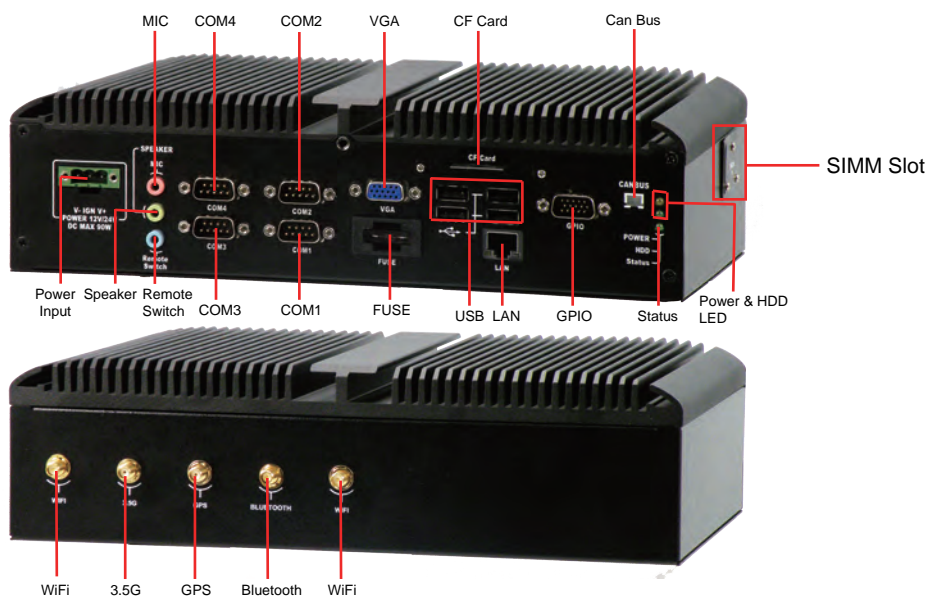
Packing List

- 1 x AR-V6002FL
- 1 x User Guide CD with driver
- 2 x Wall Mount Bracket
- 1 x Screw pack (2.5" HDD bracket : 4pcs)
- 1 x Terminal block (Plug-DC connecter)
- 1 x Remote Switch Cable
- 1 x Antenna for GPS (option)
- 2 x Antenna for WiFi (option)
- 1 x Antenna for 3.5G (option)
- 1 x Antenna for Bluetooth (option)
- 1 x Fuse 7.5A
- 1 x SATA and SATA power cable

Ordering Information

AR-V6002FLD4	AR-V6002FL with Intel Atom D425 1.8GHz, 1GB DDR3
AR-V6002FLD5	AR-V6002FL with Intel Atom D525 1.8GHz, 1GB DDR3

Optional Accessory

100070047	SIERRA WIRELESS MC8790 3.5G Module (mini-PCIe) with RF cable, screw, Antenna(L=3M)
100070053	Huawei WIRELESS EM770W 3.5G Module with RF cable, screw, Antenna(L=3M)
100070055	WIESON ZYM-5020, Cable Antenna (L=5M)
100070054	AW-NE768 WiFi-105E IEEE 802.11 b/g/n, Antenna x 2
100070056	Qcom QBTM400-01,Antenna

AR-V5403FL

ITS/Telematics
Excellent 100
REPUBLIC OF CHINA CENTENNIAL

Features

✔ Support Core 2 Duo / Core Duo/ Core Solo / Celeron M

✔ 4-bit GPIO (2 In, 2 Out)

✔ GPS / 3.5G / Wifi / Bluetooth Module Option

✔ External Removable HDD Bay

✔ Software programmable power off delay time

✔ **PTCRB Certified**

Specification

System

CPU	Intel Core 2 Duo/Core Duo/Core Solo/Celeron M : CPU T7400 / T5500 / T2500 / CM440
Chipset	Intel 945GME + ICH7M
Front Side Bus	533/667MHz
Memory	● 1 x 200-pin SO-DIMM socket support 533/667MHz DDR2 SDRAM up to 2GB ● 1GB pre-installed

Video

Graphic Controller	Intel 945GME integrated GMA 950 graphic controller
Video Memory	DVMT 3.0, Maximum 256MB shared
Video Interface	● 1 x VGA port (DB15)

Storage

IDE	1 x IDE (44-pin)
SATA	2 x SATA II port
CF	1 x External Compact Flash Type I/II socket
Disk Bay	1 x Anti-shock 2.5" HDD bracket swappable without open case

I/O

Expansion Slot	1 x miniPCIe (FOR Optional 3.5G Module only)
Ethernet	2 x Gbps RJ45 with LED, Broadcom BCM5787
Serial Port	4 x RS-232 (2 x DB9, 2 x pin header, COM3 for PIC on power circuit, COM4 for GPS)
USB	8 X USB 2.0 (4 x external port, 3 x pin header , 1 x for Mini PCIe 3.5G)
GPIO	4-bit GPIO (2 In, 2 Out) with 5 pin terminal block, 2-in/GND/2-out
Audio	Realtek ALC888 Audio Codec
Antenna Hole	1 x SMA for GPS, 1 x SMA for 3.5G, 1 x SMA for WiFi + Bluetooth
SIM	SIM slot x 1, SIM card changeable without opening case, latch to protect SIM uncertainly touch

Others

GPS(option)	GPS Module (COM4)
3.5G(option)	3.5G Module (Mini PCIe)
WiFi + Bluetooth (option)	Wifi + Bluetooth Combo module (USB2)

Hardware Feature

WatchDog Timer	Software programmable 0~255 sec.

Software

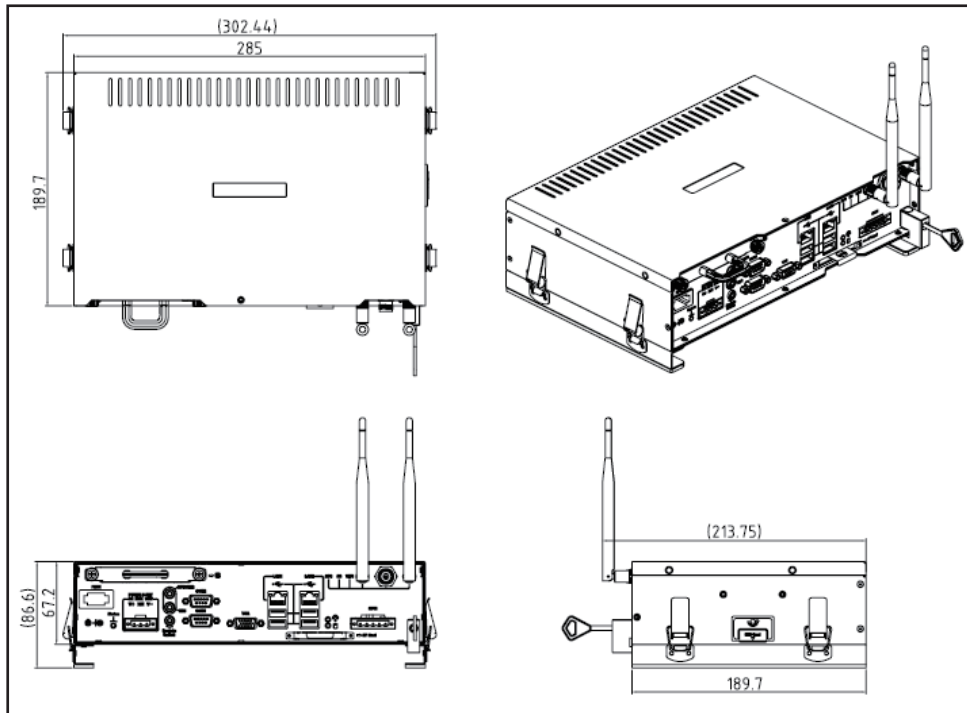|	
OS Support	Windows XP Embedded, Linux FC 12

Power

Power Input	Power onboard design (AR-B5403) ● Wide range input DC 9V~32V ● Fuse Design ● Smart ATX power function: 　a. Power on/off retry 　b. Adjustable delay time for system OFF by Switch on power module (Mode2~Mode7) 　c. System on/off by Vehicle ignition or Remote switch button 　d. Low Power input monitoring, Auto shutdown

Mechanical & Environment

Dimension(W x D x H)	189.7mm x 285mm x 67.2mm
Operating Temp.	-15~50°C (-4~122°F) with Industrial Grade CF or SSD -15~45°C (-40~113°F) for T7400 CPU with Industrial Grade CF or SSD
Storage Temp.	-20~80°C (-4~176°F)
Certification	CE, FCC class B, PTCRB

Dimension

I/O Connectors

FUSE HDD MIC SPEAKER COM2 LAN GPS 3G WiFi

External Removable HDD Bay

Power Switch Power Input Remote Switch COM1 VGA USB CF Card Power & HDD LED GPIO SIMM Slot
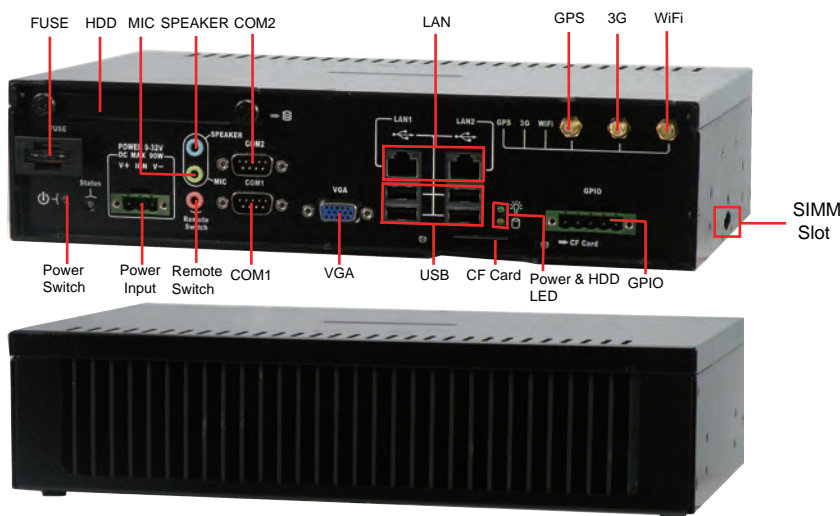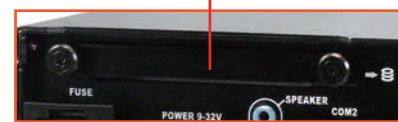
Packing List

- 1 x AR-V5403FL
- 1 x User Guide CD with driver
- 2 x Wall Mount Bracket
- 1 x Screw pack (2.5" HDD bracket : 4pcs)
- 1 x Terminal block (Plug-DC connecter)
- 1 x Terminal block (Plug-GPIO connecter)
- 1 x KB/MS Y Cable
- 1 x Fuse 7.5A for 24V vehicles

Optional Accessory

100070048	GPS module(ER-332) with RF cable, COM cable, Antenna(L=5M)
100070058	ACC-V5403FL-WLAN
100070059	ACC-V5403FL-Bluetooth
100070047	SIERRA WIRELESS MC8790 3.5G Module (mini-PCIe) with RF cable, screw, Antenna(L=3M)
100070053	Huawei WIRELESS EM770W 3.5G Module with RF cable, screw, Antenna(L=3M)

Ordering Information

AR-V5403FLT74	AR-V5403FL with Intel T7400 Core 2 Duo 2.16GHz, 1GB DDR2
AR-V5403FLT55	AR-V5403FL with Intel T5500 Core 2 Duo 1.66 GHz, 1GB DDR2
AR-V5403FLT25	AR-V5403FL with Intel T2500 Core Duo 2.0GHz, 1GB DDR2
AR-V5403FL440	AR-V5403FL with Intel Celeron M 440 1.86GHz, 1GB DDR2

AR-V5430FL

TAIWAN EXCELLENCE 2010

Features

✔ Support Core 2 Duo/Core Duo/ Celeron M

✔ VGA/DVI

✔ 8-bit GPIO (4 In, 4 Out)

✔ GPS/GPRS/WiFi Module Option

✔ Software programmable power off delay time

✔ E Mark 13 certified

Specification

System

CPU	Socket M support Intel Core 2 Duo/Core Duo/Celeron M
Chipset	Intel 945GME + Intel ICH7M
Front Side Bus	533/667MHz
Memory	● 1 x 200-pin SO-DIMM socket support 533/667MHz DDR2 SDRAM up to 2GB ● 1GB pre-installed

Video

Graphic Controller	Intel 945GME integrated GMA 950 graphic controller
Video Memory	DVMT 3.0, Maximum 256MB shared
Video Interface	● 1 x VGA port (DB15) ● 1 x DVI port

Storage

IDE	1 x IDE (44-pin)
SATA	1 x SATA II port
CF	1 x External Compact Flash Type I/II socket
Disk Bay	1 x Anti-shock 2.5" HDD bracket

I/O

Ethernet	2 x Gbps RJ45 with LED, Broadcom BCM5787
Serial Port	4 x RS-232 (2 x DB9, 2 x pin header for GPS/GPRS option)
USB	4 x USB2.0 (3 x external port, 1 x pin header for WiFi option)
GPIO	8-bit GPIO (4 In, 4 Out)
PS/2	1 x PS/2
Audio	MIC-In, SPK-Out
Remote	1 x Remote control
Fuse	15A for 12V, 0.5A for 24V
Antenna Hole	1 x GPS, 1 x GPRS, 1 x WiFi

Expansion

Module (Option)	● 1 x PCI -104 module space ● USB wireless LAN module ● RS-232 GPRS/GSM module (Default COM3) ● RS-232 GPS module (Default COM4)

Software

OS Support	Windows XP Embedded, Linux FC 6/7

Power

|	

Power Module	● Wide range input DC 9V~32V
	● Fuse Design
	● Smart ATX power function:
	  a. Power on/off retry
	  b. Adjustable delay time for system OFF by Switch on power module (Mode2~Mode7)
	  c. System on/off by Vehicle ignition or Remote switch button
	  d. Low Power input monitoring, Auto shutdown

Power Consumption	50W without external devices, 4.1A@12V

Mechanical & Environment

Thermal Design	Fanless
Chassis Material	Aluminum
Dimension (W x D x H)	279mm x 176mm x 67.2mm (10.98" x 6.93" x 2.65") 319mm x 210mm x 83mm (12.56" x 8.27" x 3.27", With bracket)
Weight	Net: 2.9kg (6.4Lb)
Vibration	IEC 60068-2-64 5~500Hz, 2GRMS for CF, 3GRMS for SSD
Shock	IEC 60068-2-27 50G-500m/s^2 -11ms
Operating Temp.	-20~50°C (-4~122°F) for Industrial grade CF
Storage Temp.	-20~80°C (-4~176°F)
Certification	CE, FCC class B, EMark 13

Dimension
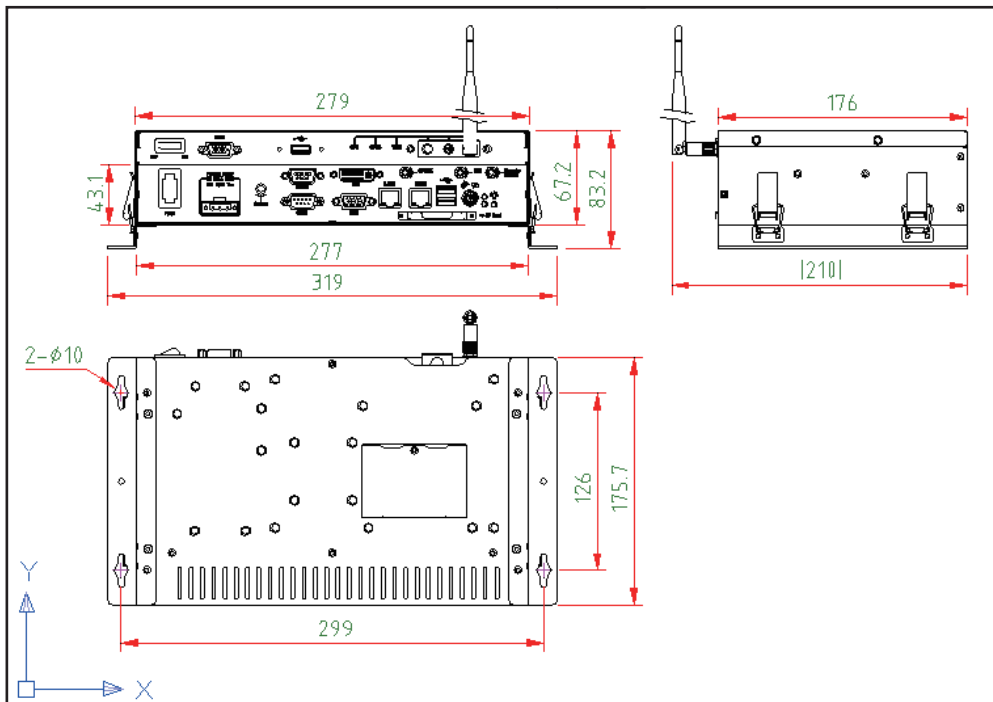
I/O Connectors

Packing List

- 1 x AR-V5430FL
- 1 x Quick user guide
- 1 x Utility CD
- 1GB memory pre-installed
- 1 x SATA cable
- 1 x SATA power cable
- 1 x Remote switch cable
- 1 x Terminal block (Female)
- 1 x Fuse for 24V input
- 1 x HDD bracket and screw
- 1 x Mounting bracket
- 1 x Screw pack

Optional Accessories

100070039	GPS module(ER-332) with RF cable, COM cable, Antenna
100070041	VIA USB WiFi module with RF cable, USB cable, Antenna
010080611	GPRS module(ACM8060) with RF cable, COM cable, Antenna

Features

- ✔ Support 12V/24V Input power
- ✔ Work as an UPS
- ✔ C-LiFePO4 Battery 12V/4.8Ah
- ✔ Auto Charge and Battery Protection

Specification

General

Battery SPEC	Backup control board with battery for Vehicle PC (With PHET C-LiFePO4 12V 4.8Ah Battery)

Specification

power input	IDC 9~32V
Power charge for Backup battery	DC 14.6V (constant-voltage, CV)
Power charge for backup battery current limit	Max. 4.8A
Backup battery cut off voltage	10.6V
Backup battery low voltage warning	DC 11.2V till DC 10.6V
Capacity LED	3 Green LED to present the Battery capacity status
Charging LED	1 Yellow LED to present Battery charging status
Fuse socket	Input protection : Fuse 12V(15A), 24V(7.5A)

I/O

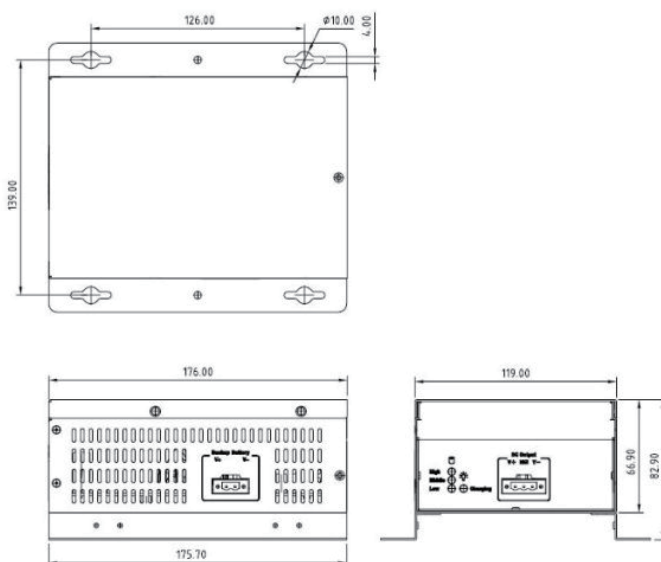|	
Man power in	Terminal block 4 pin : Positive, Ground, Ignition
Backup battery	Terminal block 2 pin : Positive, Ground
Power output	Terminal block 3 pin : Positive, Ground

Mechanical & Environment

Dimension (W x D x H)	System box with bracket : 159 mmx 176 mm x 82.9 mm Battery: 60mm x 120mm x 105 mm
Weight	Battery:0.96Kg
Operating Temp.	System : -20~65°C Battery : 0~45°C, 45~85%RH (In Std. charging) -20~60°C, 45~85%RH (In Std. discharging)
Storage Temp.	System: -20~80°C
Certification	Battery: -20~35°C (Within 1 year) -20~60°C (Within 6 month)
Relative Humidity	0~90% @ 40°C,non-condensing
Safety	CE, FCC class A

Function Diagram

9~32V DC Input   14.65V DC Output

Vehicle Main Power → ACC-VBAT-12 → In-Vehicle Computer

Backup Battery

: V+ (Car Main power +)
: V+ (Battery Main power +)
: V- (Car Main power-, GND)
: Ignition Signal Input

Ignition on:
  1. Only use car main battery power.
  2. Charging backup battery.
Ignition off:
  1. Only use backup battery power.
  2. Stop charging backup battery.

Dimension

❖ Mobility Solution

Model name	Description	Model name	Description
AR-B2011	ACM8060 , Quad band GSM/GPRS Module	ACC-V5430-WLBT	Uconnect WLBT-Combo-E WiFi+Bluetooth Module , Support IEEE 802.11b/g , Bluetooth V2.0 with EDR support
ACC-V5430-WLAN	VIA-VNT6656G6A40 WiFi module, Support IEEE 802.11 b/g	ACC-V6002-GPS	WIESON ZYM-5020 GPS Module, Tracking Sensitivity: -160 dBm, Cold start under 30 seconds
ACC-V5430-GPS	GlobalSat ET-332 GPS module, Tracking Sensitivity: -160 dBm, Cold start under 40 seconds	ACC-V6002-WiFi	AW-NE768 WiFi-105E Module, Support IEEE 802.11b/g /n
ACC-V5403-3.5G-Sierra	Sierra MC8790 3.5G Module, Operation up to 75°C, Support GSM/GPRS/EDGE/UMTS/HSDPA	ACC-V6002-BT	Qcom QBTM400-01 Bluetooth Module, Bluetooth V2.1 with EDR support
ACC-V5403-3.5G Huawei	Huawei EM770W 3.5G Module, Operation up to 55°C, Support GSM/GPRS/EDGE/UMTS/HSDPA		

Vehicle grade LCD touch Monitor for In-Vehicle Application.

In the fast paced world of transportation services, touch monitor where display information is vital for coordinating field operation. The leading designer and manufacturer of In-Vehicle Computer manufacturer ACROSSER, launches its four Industrial grade LCD touch monitors for In-Vehicle Application that greatly enhance its product line.

Whether it is for fleet management, taxi dispatch and infotainment, or police car, they all share common requirements: sunlight readable touch, wide operating temperatures, wide voltage. Acrosser' s Vehicle grade LCD touch Monitor products feature Automatic screen brightness adjustment feature, Industrial grade high brightness, daylight readable LED backlit, DC9 to 32V power input and wide operating temperatures to accommodate these special environmental needs.

To allow a multitude of applications to be addressed, Acrosser' s in-vehicle display incorporates NTSC, PAL, SECAM automatic switch, Automatic switch to video input while signal present, audio input and speaker, IR remote controller and support USB hub for external USB devices .In addition, options such as daylight-readable touch screen (anti-reflection coating) and VESA 75, stand or headrest mount kit are also available.

With All-in-One connector (VGA/USB/DC Jack/Audio), Acrosser' s in-vehicle display is the perfect companion to a variety of in-vehicle computer systems including Acrosser' s industry leading In-Vehicle Computer Series.

AR-DP070VW

AR-DP080VW

AR-DP080V

AR-DP100VW

In-Vehicle Touch monitor Series main features:

	AR-DP070VW	AR-DP080VW	AR-DP080V	AR-DP100VW
Specification				
Panel Size	7" 16:9 wide screen	8" 16:9 wide screen	8" 4:3 wide screen	10.2" 16:9 wide screen
Luminance(cd/m^2)	400 nits LED backlight	500 nits LED backlight	600 nits LED backlight	600 nits LED backlight
Video Interface	VGA plus 3 video inputs			
Video Formats	NTSC, PAL, SECAM automatic switch			
Power Input	DC 9 to 32V			
Automatic Dimmer	N	Y	Y	Y
USB resistive touch screen	Y	Y	Y	Y
Audio input and speaker	Y	Y	Y	Y
All-In-One connector	Y	Y	Y	Y
Auto video input switch	Automatic Switch to video input while signal present			
Auto power on VGA	Automatic power on by VGA input			
IR remote controller	Y	Y	Y	Y
Mounting	VESA 75, stand or headrest mount	VESA 75 or stand mount	VESA 75 or stand mount	VESA 75 or stand mount
Operating tempeature	0~70°	-10~60°	-35~85°	-35~85°
Optional	anti-reflection coating	anti-reflection coating	anti-reflection coating	anti-reflection coating
	-	-	USB hub for external USB device	-

AR-DP070VW

Features

- ✔ 7-Inch (16:9) Wide Screen
- ✔ LED Backlight with Low Power Consumption
- ✔ Resistive Touch Screen
- ✔ VESA75 Mounting and Stand
- ✔ DC 9-32V Power Input

Specification

LCD

Panel Size	7-inch Wide Screen (16:9)
Resolution	Supports from 640 x 480~1600 x 1024 pixels
Luminance (cd/m2)	400nits
View Angle (H/V)	H:110, V:120
Backlight Lifetime	30,000 hours
Touch Screen Type	4-wire resistive

I/O

Video Interface	1 x VGA
USB	1 x USB for Touch Screen
Audio	1 x 3.5mm stereo Jack

Power Requirement

Power Input	DC 9~32V

Software

|	
Touch Driver Support	Windows: Win 7, Vista, XP, 2000, NT4, ME, 98, 95, XP Tablet PC, CE.net 6.0, MS-DOS. Linux: Linux Kernel 2.3, 2.6. Mac: Mac OS9, OSX

Mechanical & Environment

Chassis Material	Steel
Dimension (W x H x D)	179 x 129 x 29mm (W x H x D)
Mounting	VESA 75 , Headrest Shroud , Stand
Operating Temp.	0~70ºC
Storage Temp.	-20~70ºC
Relative Humidity	85% RH
Safety	CE, FCC

Packing List

- User Manual x 1
- Metal Stand x 1
- All-in-One Cable x 1 (VGA / USB / DC Jack / Audio)
- Remote Controller x 1
- Touch Driver CD x 1
- Touch Stylus x 1
- Car Cigaratte Lighter Adapter x 1
- AC Switching Power Supply x 1

Dimension

92.88
154.20
179.47
129.46
10.00 20.70

AR-DP080V
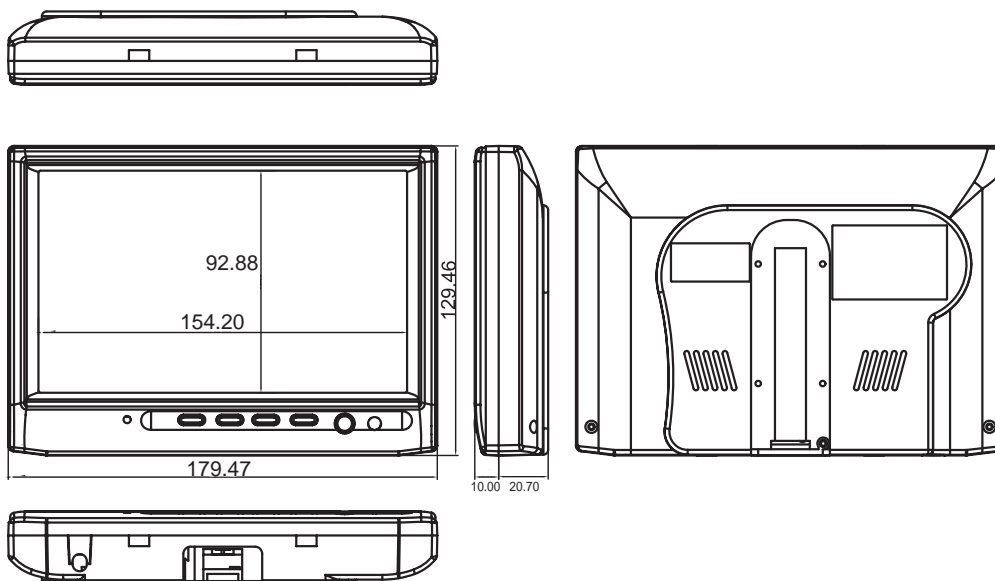
Features

- ✔ 8-Inch(4:3) Wide Screen
- ✔ LED Backlight with Low Power Consumption
- ✔ Resistive Touch Screen
- ✔ VESA75 Mounting and Stand
- ✔ DC 9-32V Power Input

Specification

Panel

Panel Size	8-Inch Screen (4:3)
Resolution	Supports from 640 x 480~1024 x 768 pixels
Luminance (cd/m2)	600 nits
View Angle (H/V)	H:140 / V:120
Backlight Lifetime	20,000 hours
Touch Screen Type	4-wire resistive

I/O

Video Interface	1 x VGA
USB	1 x USB for Touch Screen
Audio	1 x 3.5mm stereo Jack

Power Requirement

Power Input	DC 9~32V

Software

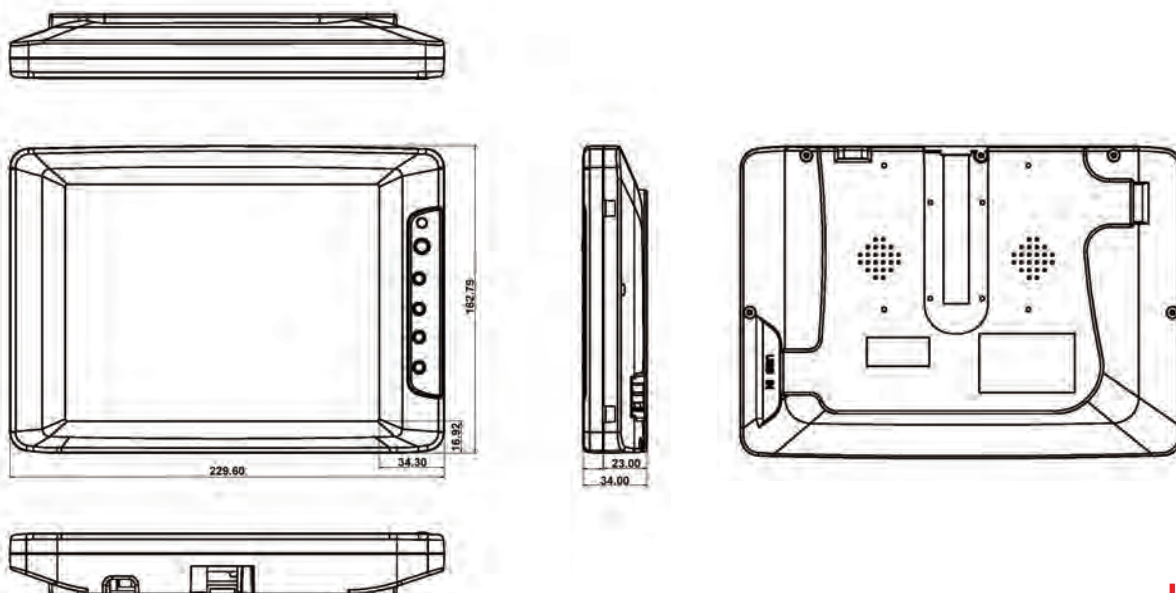|	
Touch Driver Support	Windows: Vista, 9X, Me, NT4.0, 2000, XP, CE.net, CE 2.12, CE 3.0, Embedded, Dos. Mac: Mac OS 9X, OS X (Intel CPU). Linux: Linux Readme, Mandrake, Red Hat, Fedora Core, SuSE, Debian, Ubuntu, Yellow Dog

Mechanical & Environment

Chassis Material	Plastic
Dimension (W x H x D)	229.6 x 162.8 x 33.9 mm (W x H x D)
Mounting	VESA 75, Metal Stand
Operating Temp.	-10~60°C
Storage Temp.	-30~70°C
Relative Humidity	-
Safety	CE, FCC

Packing List

- User Manual x 1
- Metal Stand x 1
- All-in-One Cable x 1 (VGA / USB / DC Jack / Audio)
- Remote Controller x 1
- Touch Driver CD x 1
- Touch Stylus x 1
- Car Cigaratte Lighter Adapter x 1
- AC Switching Power Supply x 1

Dimension

AR-DP080VW

8-Inch(16:9) Display Monitor with VGA, USB Touch Screen and DC 9-32V Input for Car PC and In-Vehicle Application

Features

- ✔ 8-Inch(16:9) Wide Screen
- ✔ LED Backlight with Low Power Consumption
- ✔ Resistive Touch Screen
- ✔ VESA75 Mounting and Stand
- ✔ DC 9-32V Power Input

Specification

Panel

Panel Size	8-Inch Wide Screen (16:9)
Resolution	Supports from 640 x 480~1024 x 768 pixels
Luminance (cd/m2)	500 nits
View Angle (H/V)	H:120 / V:100
Backlight Lifetime	20,000 hours
Touch Screen Type	4-wire resistive

I/O

Video Interface	1 x VGA
USB	1 x USB for Touch Screen
Audio	1 x 3.5mm stereo Jack

Power Requirement

Power Input	DC 9~32V

Software

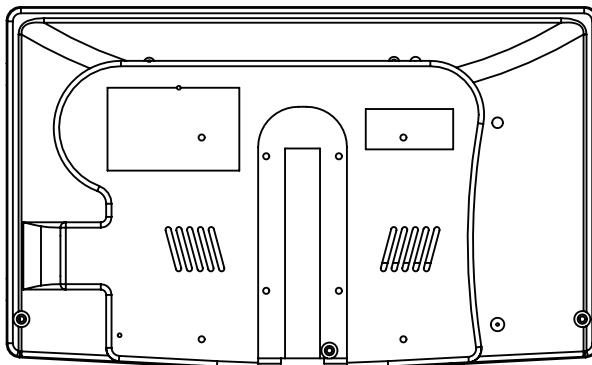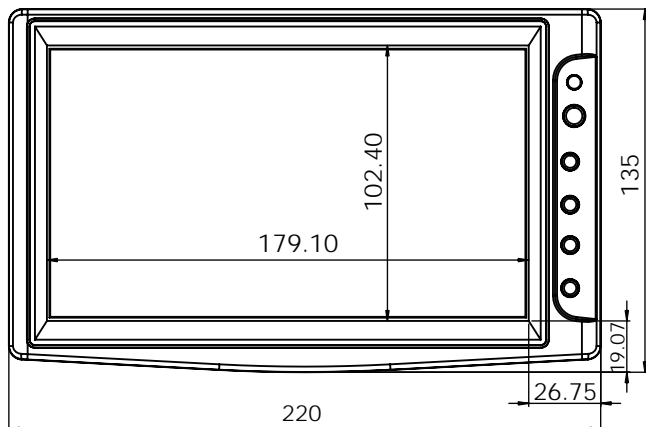|	
Touch Driver Support	Windows: Vista, 9X, Me, NT4.0, 2000, XP, CE.net, CE 2.12, CE 3.0, Embedded, Dos. Mac: Mac OS 9X, OS X (Intel CPU). Linux: Linux Readme, Mandrake, Red Hat, Fedora Core, SuSE, Debian, Ubuntu, Yellow Dog

Mechanical & Environment

Chassis Material	Plastic
Dimension (W x H x D)	220 x 135 x 29 mm (W x H x D)
Mounting	VESA 75, Metal Stand
Operating Temp.	-30~85°C
Storage Temp.	-40~95°C
Relative Humidity	-
Safety	CE, FCC

Packing List

- User Manual x 1
- Metal Stand x 1
- All-in-One Cable x 1 (VGA / USB / DC Jack / Audio)
- Remote Controller x 1
- Touch Driver CD x 1
- Touch Stylus x 1
- Car Cigaratte Lighter Adapter x 1
- AC Switching Power Supply x 1

Dimension

10.2-Inch(16:9) Display Monitor with VGA, USB Touch Screen and DC 9-32V Input for Car PC and In-Vehicle Application

Features

- ✔ 10.2-Inch(16:9) Wide Screen
- ✔ LED Backlight with Low Power Consumption
- ✔ Resistive Touch Screen
- ✔ VESA75 Mounting and Stand
- ✔ DC 9-32V Power Input

Specification

Panel

Panel Size	10.2-Inch Screen (16:9)
Resolution	Supports from 640 x 480~1024 x 768 pixels
Luminance (cd/m2)	400 nits
View Angle (H/V)	H:140 / V:120
Backlight Lifetime	30,000 hours
Touch Screen Type	4-wire resistive

I/O

Video Interface	1 x VGA
USB	1 x USB for Touch Screen
Audio	1 x 3.5mm stereo Jack

Power Requirement

Power Input	DC 9~32V

Software

Touch Driver Support	Windows: Vista, 9X, Me, NT4.0, 2000, XP, CE.net, CE 2.12, CE 3.0, Embedded, Dos. Mac: Mac OS 9X, OS X (Intel CPU). Linux: Linux Readme, Mandrake, Red Hat, Fedora Core, SuSE, Debian, Ubuntu, Yellow Dog

Mechanical & Environment

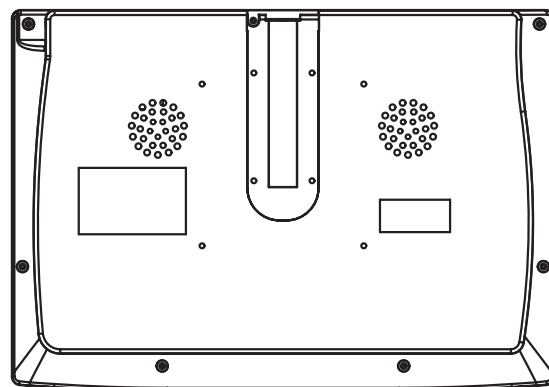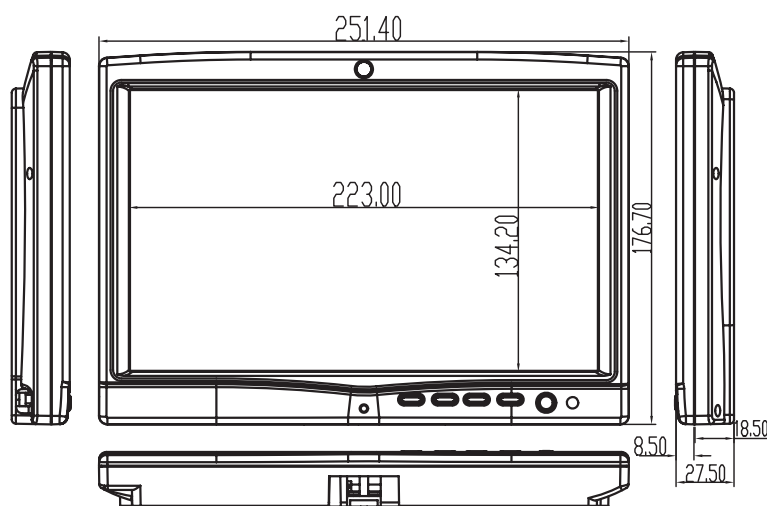|	
Chassis Material	Plastic
Dimension (W x H x D)	251.5 x 176.7 x 27.5 mm (W x H x D)
Mounting	VESA 75, Metal Stand
Operating Temp.	-30~85ºC
Storage Temp.	-40~85ºC
Relative Humidity	-
Safety	CE, FCC

Packing List

- User Manual x 1
- Metal Stand x 1
- All-in-One Cable x 1 (VGA / USB / DC Jack / Audio)
- Remote Controller x 1
- Touch Driver CD x 1
- Touch Stylus x 1
- Car Cigaratte Lighter Adapter x 1
- AC Switching Power Supply x 1

Dimension

ACROSSER

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